Optical Microscope Software for Breast Cancer Diagnosis

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Keywords: Software, diagnosis, breast cancer, image analysis, tissue sections, gene repositioning

Summary: The National Cancer Institute, Optical Microscopy and Analysis Laboratory is seeking parties interested in collaborative research to further co-develop software for cancer diagnosis.

Technology:
Several genes have been identified that have altered spatial positioning inside the nucleus of breast cancer cells when compared to normal breast tissue. This suggests that cancer cells may have disease specific, three-dimensional gene arrangements that may help distinguish cancer tissue from normal tissue. This may represent a novel method of cancer diagnosis. The software provides a set of tools for performing diagnostic or prognostic assays on new unseen datasets. This software also could be used on its own or to supplement and enhance the methods currently used for cancer diagnosis and detection.

Researchers at NCI have developed computer software able to analyze optical microscopic images of human breast tissue sections for diagnosing cancer by using the differences in spatial positioning of certain genes. The software uses the inherent hierarchy in the data and stores all the analysis and manual interaction information in a highly structured XML file. It is user-friendly and able to discriminate normal and cancerous human breast tissue section images in large datasets. A cluster of computers is used in the background to reduce the analysis time for large image datasets.

Potential Commercial Applications:
- Could be an essential part of integrated diagnostic or prognostic assay for breast cancer detection
- Research tool for testing new biomarkers and their applicability for cancer diagnosis
- Could provide an important information for understanding the underlying causes of gene repositioning

Competitive Advantages:
- The software can be used to analyze large datasets
- Reduces processing time by at least 10 fold

Development Stage: Prototype, *in vivo* data available

Patent Status: Research tool. Patent protection is not being pursued for this technology.

Contact: Please submit an information request form at http://techtransfer.cancer.gov or contact John Hewes, Ph.D., (301) 435-3121, hewesj@mail.nih.gov.

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